

Exhibit E

Consequences and Implications of Selfie Manipulation: Literature Review

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EXECUTIVE SUMMARY

Human survival has been predicated on our capacity to connect with others for safety. As such, we are hard-wired to increase our attractiveness and value to others by modifying ourselves in social contexts (Goffman, 2002). Technology provides new ways to modify ourselves including the possibility of physically altering our appearance in selfies by lightening our skin, creating fuller lips, and adjusting our body size. While this may foster social acceptance and help us meet our fundamental need to belong, viewing edited selfies of “normal” people exposes us to standards of attractiveness we cannot achieve, but now believe is attainable by our peers. Ironically, this very tool that is supposed to increase our social connection, may actually make us feel more like outsiders.

Although research examining selfie manipulation is in its infancy, findings to date suggest it exacerbates risk and maintenance of several mental health concerns including body dissatisfaction, eating disorders and body dysmorphic disorder cross-culturally (Kleemans et al., 2018, McLean et al., 2015, Mills et al., 2018, Rajanala et al., 2018). Research indicates that young girls believe manipulated photos of peers are realistic and experience increases in body dissatisfaction after being exposed to edited selfies (Kleemans et al., 2018). There is also evidence that editing one’s own selfies is related to body dissatisfaction, eating concerns and anxiety (McLean et al., 2015, Mills et al., 2018). Plastic surgeons are being warned to assess their patients for what is colloquially termed “Snapchat Dysmorphia,” or the drive for cosmetic surgery that alters one’s appearance to look like their photo-edited selfies (Rajanala et al., 2018) and at least 20% of Korean adults undergo cosmetic surgery (Holliday & Elfvig-Hwang, 2012). While not all individuals will be at risk for these mental health concerns, data suggest that selfie manipulation is deleterious to many.

Even beyond mental health concerns, data indicates that editing selfies may have a paradoxical effect with regards to social connection. Rather than increasing acceptance, studies indicate that women are actually more critical of female peers they believe have digitally altered their selfies (Vendemia & DeAndrea, 2018). Public opinion also indicates Facebook may alienate users by incorporating selfie-editing tools. Many argue photo-editing apps are harmful and culturally insensitive, (e.g., byrslf.co, 2016) and social media companies have received backlash for endorsing these westernized standards of beauty (Huffingtonpost.com, 2016 & 2017).

Selfie filters risk propagating unrealistic standards of beauty that are not only harmful, but divide more than they unite. Whether adolescents and young women are from Asia, America or Australia, studies indicate they are all engaging in photo-editing to achieve unachievable beauty standards in response to continuous feedback that they, as they are, are not “good enough” (Chae, 2017; Chua and Chang, 2016, Fox & Vendemia, 2016; Mclean et al., 2015). This in turn only perpetuates and exacerbates risk for body dissatisfaction, eating disorder behaviors, depression and anxiety across the globe (Thompson et al., 1999; Grabe et al., 2008).

hundred forty-four adolescent girls between the ages of 14-18 living in the Netherlands were randomly assigned to view either original (unaltered) Instagram selfies or the same selfies that had been manipulated using filters (i.e., eye bags, wrinkles and impurities were removed and bodies were reshaped to appear thinner). The girls thought the manipulated selfies were realistic and rated them more positively than the unedited selfies. Exposure to the manipulated photos decreased body satisfaction, with effects strongest for girls who tend to engage in social comparison more frequently.

Data also indicates a relationship between manipulating selfies and body dissatisfaction, eating concerns and anxiety (McLean et al., 2015, Mills et al., 2018). McLean et al. (2015) examined associations between selfie sharing behavior, and body and eating concerns among a sample of 7th grade girls living in Australia. The study also examined the relevance of *photo investment* and *photo manipulation*. Photo investment was defined as the effort and concern placed on selecting and posting photos of themselves (e.g., rating the perceived difficulty of selecting photos using a visual analogue scale ranging from 0-100: “0 = It’s easy to choose the photo” and “100 = It’s hard to choose the photo”). *Photo manipulation* was defined as the frequency of engaging in photo manipulation before posting photos to social media (e.g., rating how frequently do you “Edit or use apps to smooth skin” and “Make yourself look skinnier” on a scale ranging from 1=Never to 5=Always). **The relationship between sharing selfies and eating and body concerns was strongest for girls who reported higher photo investment and manipulation.** Additionally, **higher engagement in photo manipulation and investment, but not higher media exposure, was associated with greater eating and body image concerns.** Although the study cannot determine causality, findings indicate that photo investment and selfie manipulation may at the very least perpetuate body dissatisfaction and eating disorder symptoms among those already struggling. **Findings also indicate that how individuals interact with social media (e.g., engaging in photo manipulation) is more relevant to body dissatisfaction and eating disorder behavior than overall engagement in social media activities,** which is consistent with the findings of Meier and colleagues (2014).

Body Dysmorphic Disorder

Manipulating and viewing selfies that have been altered may also be particularly problematic for individuals struggling with body dysmorphic disorder. Body dysmorphic disorder is a body-image disorder characterized by emotionally distressing and life-interfering preoccupation of an imagined or slight imperfection in one’s appearance (e.g., skin color, chest size, nose shape) (American Psychiatric Association, 2013). Individuals with body dysmorphic disorder do not have general weight or shape concerns or engage in disordered eating like individuals with eating disorders, but instead experience intrusive and persistent thoughts about one particular aspect of appearance. In the United States, 1 in 50 individuals meet diagnostic criteria for body dysmorphic disorder with typical onset in early adolescence (12-13 years of age) (American Psychiatric Association, 2013).

Findings from the 2017 Annual American Academy of Facial Plastic and Reconstructive Surgery (AAFPRS) indicate that **photo-editing apps are associated with detrimental effects among people with body dysmorphic disorder** (Rajanala et al., 2018). Plastic surgeons report an alarming increase in the number of surgeries patients are requesting to make themselves look like photo-edited pictures of themselves (e.g., fuller lips, bigger eyes, thinner nose). **Colloquially termed “Snapchat Dysmorphia”, 55% of surgeons reported seeing patients that requested**